

### **Notes for Figure 6H-41—Typical Application 41 Median Crossover for an Exit Ramp**

**Guidance:**

- 1. This typical application should be used for carrying an exit ramp across a closed directional roadway of a divided highway. The design criteria contained in the AASHTO "Policy on the Geometric Design of Highways and Streets" (see Section 1A.11) should be used for determining the curved alignment.*
- 2. The guide signs should indicate that the ramp is open, and where the temporary ramp is located. Conversely, if the ramp is closed, guide signs should indicate that the ramp is closed.*
- 3. When the exit is closed, a black on orange EXIT CLOSED sign panel should be placed diagonally across the interchange/intersection guide signs and channelizing devices should be placed to physically close the ramp.*
- 4. In the situation (not shown) where channelizing devices are placed along the mainline roadway, the devices' spacing should be reduced in the vicinity of the off ramp to emphasize the opening at the ramp itself. Channelizing devices and/or temporary pavement markings should be placed on both sides of the temporary ramp where it crosses the median and the closed roadway.*
- 5. Advance guide signs providing information related to the temporary exit should be relocated or duplicated adjacent to the temporary roadway.*

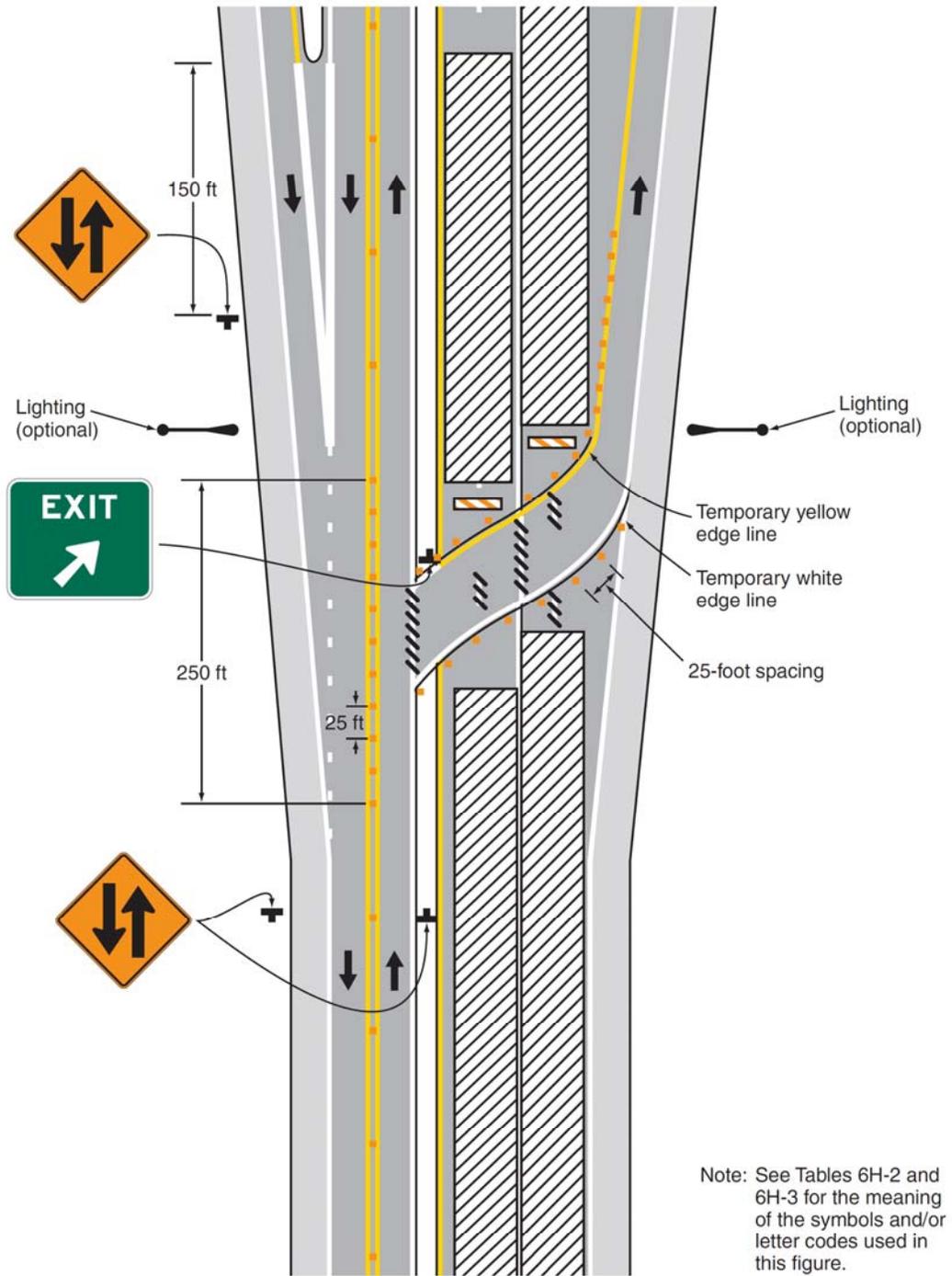
**Standard:**

- 6. A temporary EXIT sign shall be located in the temporary gore. For better visibility, it shall be mounted a minimum of 7 feet from the pavement surface to the bottom of the sign.**

**Option:**

7. Guide signs referring to the exit may need to be relocated to the median.
8. The temporary EXIT sign placed in the temporary gore may be either black on orange or white on green.
9. In some instances, a temporary deceleration lane may be useful in facilitating the exiting maneuver.
10. When a temporary traffic barrier is used to separate opposing vehicular traffic, the Two-Way Traffic signs may be omitted.

**Figure 6H-41. Median Crossover for an Exit Ramp (TA-41)**



**Typical Application 41**

### **Notes for Figure 6H-42—Typical Application 42 Work in the Vicinity of an Exit Ramp**

*Guidance:*

- 1. The guide signs should indicate that the ramp is open, and where the temporary ramp is located. However, if the ramp is closed, guide signs should indicate that the ramp is closed.*
- 2. When the exit ramp is closed, a black on orange EXIT CLOSED sign panel should be placed diagonally across the interchange/intersection guide signs.*
- 3. The design criteria contained in the AASHTO "Policy on the Geometric Design of Highways and Streets" (see Section 1A.11) should be used for determining the alignment.*

**Standard:**

- 4. A temporary EXIT sign shall be located in the temporary gore. For better visibility, it shall be mounted a minimum of 7 feet from the pavement surface to the bottom of the sign.**

*Option:*

- 5. The temporary EXIT sign placed in the temporary gore may be either black on orange or white on green.*
- 6. An alternative procedure that may be used is to channelize exiting vehicular traffic onto the right-hand shoulder and close the lane as necessary.*

**Standard:**

- 7. An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.**

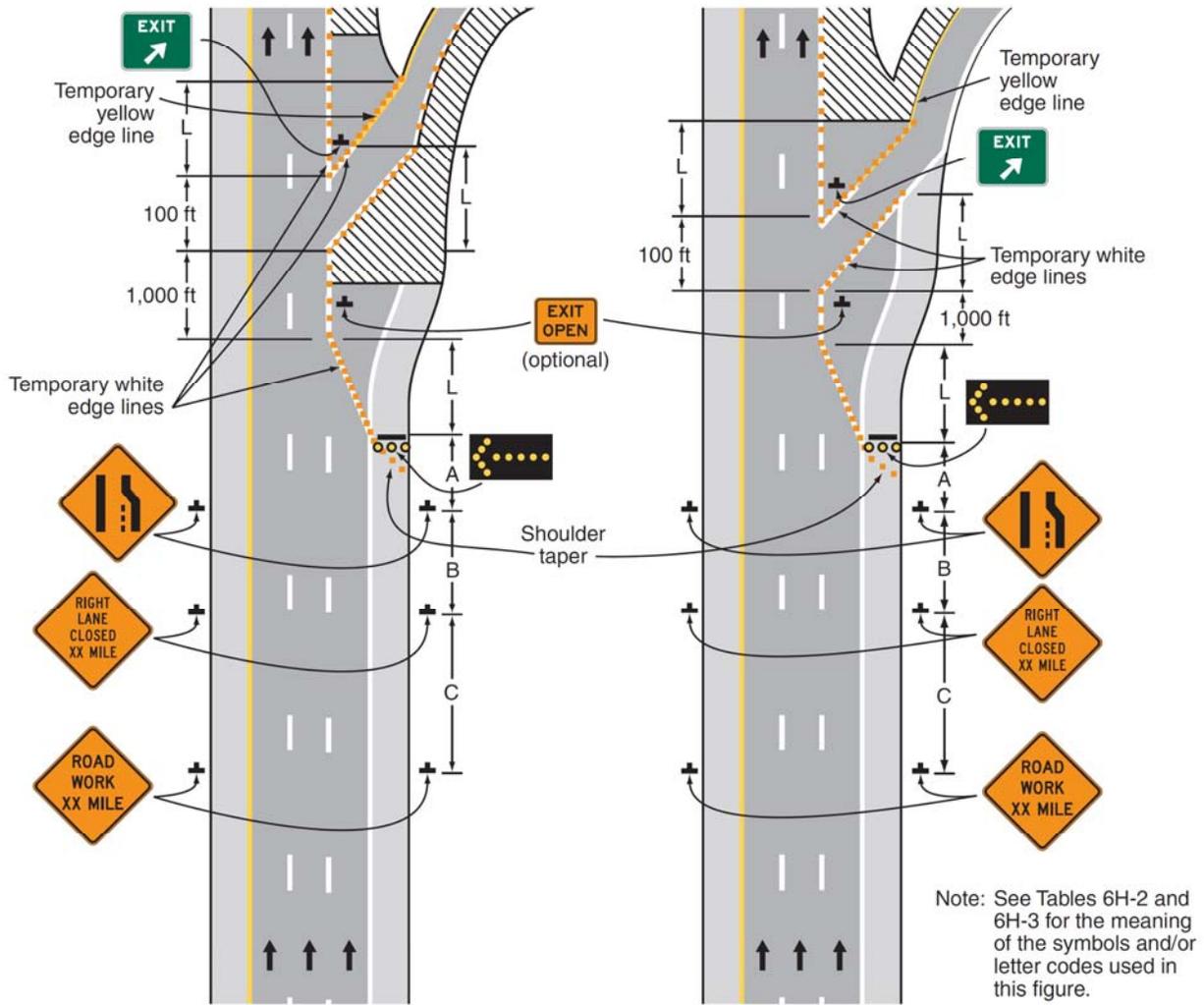
*Option:*

The Department of Transportation's Standard Plan T10, T10A and T14 may be used instead of this typical application.

*Support:*

See Section 1A.11 for information regarding this publication.

**Figure 6H-42. Work in the Vicinity of an Exit Ramp (TA-42)**



**Typical Application 42**

### **Notes for Figure 6H-43—Typical Application 43 Partial Exit Ramp Closure**

*Guidance:*

1. *Truck off-tracking should be considered when determining whether the minimum lane width of 10 feet is adequate (see Section 6G.08).*

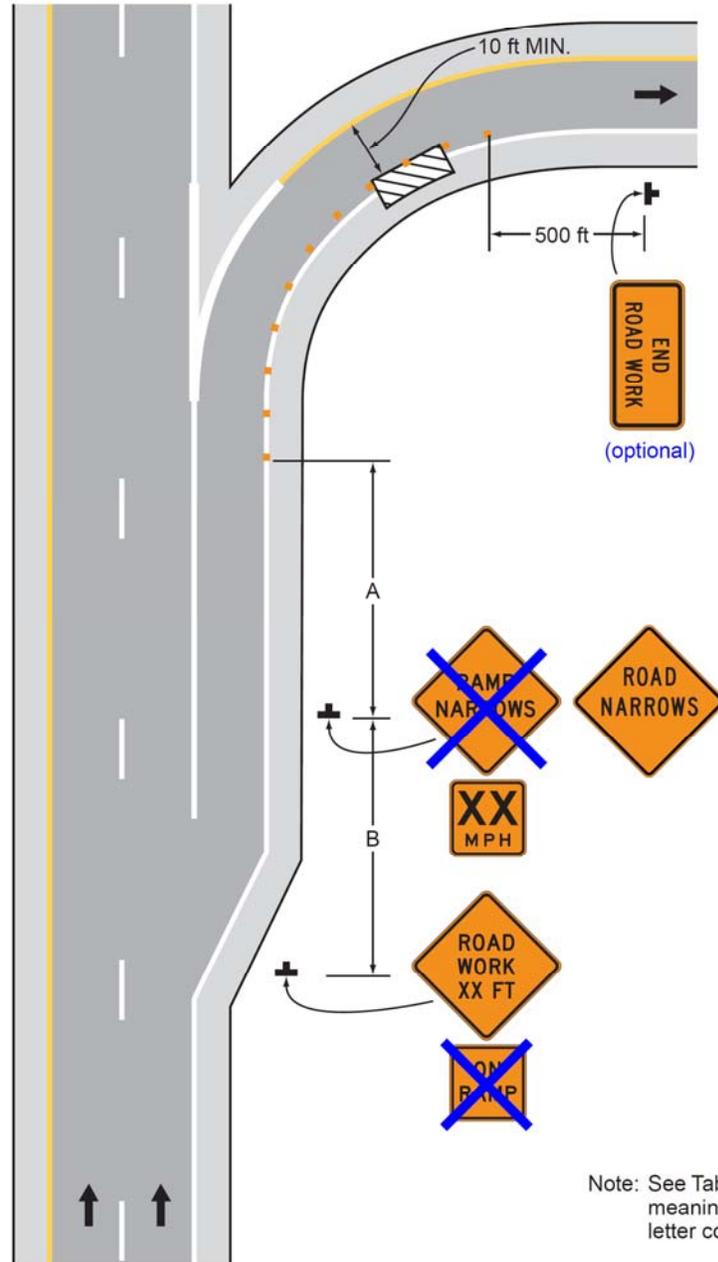
**Standard:**

2. **The RAMP NARROWS (W5-4) sign shall not be used in California. The ROAD NARROWS (W5-1) sign or NARROW LANE(S) (C12(CA)) sign, as appropriate, shall be used instead. See Sections 2C.19 and 6F.102(CA).**

*Guidance:*

3. *For planned partial ramp closure, consideration should be given to closing the entire exit ramp. Refer to Department of Transportation's Standard Plan T14. See Section 1A.11 for information regarding this publication.*

**Figure 6H-43. Partial Exit Ramp Closure (TA-43)**



**Typical Application 43**

### **Notes for Figure 6H-44—Typical Application 44 Work in the Vicinity of an Entrance Ramp**

*Guidance:*

1. An acceleration lane of sufficient length should be provided whenever possible as shown on the left diagram.

**Standard:**

2. **For the information shown on the diagram on the right-hand side of the typical application, where inadequate acceleration distance exists for the temporary entrance, the YIELD sign shall be replaced with STOP signs (one on each side of the approach).**

*Guidance:*

3. When used, the YIELD or STOP sign should be located so that ramp vehicular traffic has adequate sight distance of oncoming mainline vehicular traffic to select an acceptable gap in the mainline vehicular traffic flow, but should not be located so far forward that motorists will be encouraged to stop in the path of the mainline traffic. Also, a longer acceleration lane should be provided beyond the sign to reduce the gap size needed. If insufficient gaps are available, consideration should be given to closing the ramp.
4. Where STOP signs are used, a temporary stop line should be placed across the ramp at the desired stop location.
5. The mainline merging taper with the arrow board at its starting point should be located sufficiently in advance so that the arrow board is not confusing to drivers on the entrance ramp, and so that the mainline merging vehicular traffic from the lane closure has the opportunity to stabilize before encountering the vehicular traffic merging from the ramp.
6. If the ramp curves sharply to the right, warning signs with advisory speeds located in advance of the entrance terminal should be placed in pairs (one on each side of the ramp).

**Option:**

7. A Stop Beacon (see Section 4L.05) or a Type B high-intensity warning flasher with a red lens may be placed above the STOP sign.
8. Where the acceleration distance is significantly reduced, a supplemental plaque may be placed below the Yield Ahead sign reading NO MERGE AREA.

**Standard:**

9. **An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.**

**Option:**

The Department of Transportation's Standard Plan T10, T10A and T14 may be used instead of this typical application.

**Support:**

See Section 1A.11 for information regarding this publication.



## **Notes for Figure 6H-45—Typical Application 45 Temporary Reversible Lane Using Movable Barriers**

### **Support:**

1. This application addresses one of several uses for movable barriers (see Section 6F.85) in highway work zones. In this example, one side of a 6-lane divided highway is closed to perform the work operation, and vehicular traffic is carried in both directions on the remaining 3-lane roadway by means of a median crossover.  
To accommodate unbalanced peak-period vehicular traffic volumes, the direction of travel in the center lane is switched to the direction having the greater volume, with the transfer typically being made twice daily. Thus, there are four vehicular traffic phases described as follows:
  - a. Phase A—two travel lanes northbound and one lane southbound;
  - b. Transition A to B—one travel lane in each direction;
  - c. Phase B—one travel lane northbound and two lanes southbound; and
  - d. Transition B to A—one travel lane in each direction.The typical application on the left illustrates the placement of devices during Phase A. The typical application on the right shows conditions during the transition (Transition A to B) from Phase A to Phase B.

### **Guidance:**

2. *For the reversible-lane situation depicted, the ends of the movable barrier should terminate in a protected area or a crash cushion should be provided. During Phase A, the transfer vehicle should be parked behind the downstream end of the movable barrier for southbound traffic as shown in the typical application on the left. During Phase B, the transfer vehicle should be parked behind between the downstream ends of the movable barriers at the north end of the TTC zone as shown in the typical application on the right. The transition shift from Phase A to B should be as follows:*
  - a. *Change the signs in the northbound advance warning area and transition area from a LEFT LANE CLOSED AHEAD to a 2 LEFT LANES CLOSED AHEAD. Change the mode of the second northbound arrow board from Caution to Right Arrow.*
  - b. *Place channelizing devices to close the northbound center lane.*
  - c. *Move the transfer vehicle from south to north to shift the movable barrier from the west side to the east side of the reversible lane.*
  - d. *Remove the channelizing devices closing the southbound center lane.*
  - e. *Change the signs in the southbound transition area and advance warning area from a 2 LEFT LANES CLOSED AHEAD to a LEFT LANE CLOSED AHEAD. Change the mode of the second southbound arrow board from Right Arrow to Caution.*
3. *Where the lane to be opened and closed is an exterior lane (adjacent to the edge of the traveled way or the work space), the lane closure should begin by closing the lane with channelizing devices placed along a merging taper using the same information employed for a stationary lane closure. The lane closure should then be extended with the movable-barrier transfer vehicle moving with vehicular traffic. When opening the lane, the transfer vehicle should travel against vehicular traffic. The merging taper should be removed in a method similar to a stationary lane closure.*

### **Option:**

4. The procedure may be used during a peak period of vehicular traffic and then changed to provide two lanes in the other direction for the other peak.
5. A longitudinal buffer space may be used in the activity area to separate opposing vehicular traffic.
6. A work vehicle or a shadow vehicle may be equipped with a truck-mounted attenuator.

### **Standard:**

7. **An arrow board shall be used when a freeway lane is closed. When more than one freeway lane is closed, a separate arrow board shall be used for each closed lane.**



### **Notes for Figure 6H-46—Typical Application 46 Work in the Vicinity of a Grade Crossing**

*Guidance:*

1. *When grade crossings exist either within or in the vicinity of roadway work activities, extra care should be taken to minimize the probability of conditions being created, by lane restrictions, flagging, or other operations, where vehicles might be stopped within the grade crossing, considered as being 15 feet on either side of the closest and farthest rail. This should include roadway work activities on a street parallel to a highway-rail grade crossing where right-hand turns or left-hand turns could be impacted.*

**Standard:**

2. **If the queuing of vehicles across active rail tracks cannot be avoided, a uniformed law enforcement officer or flagger shall be provided at the grade crossing to prevent through or turning vehicles from stopping within the grade crossing (as described in Note 1), even if automatic warning devices are in place.**

*Guidance:*

3. *Early coordination with the railroad company or light rail transit agency should occur before work starts.*
4. *In the example depicted, the buffer space of the activity area should be extended upstream of the grade crossing (as shown) so that a queue created by the flagging operation will not extend across the grade crossing.*
5. *The DO NOT STOP ON TRACKS sign should be used on all approaches to a grade crossing within the limits of a TTC zone.*

*Option:*

6. *Flashing warning lights and/or flags may be used to call attention to the advance warning signs.*
7. *A BE PREPARED TO STOP sign may be added to the sign series.*

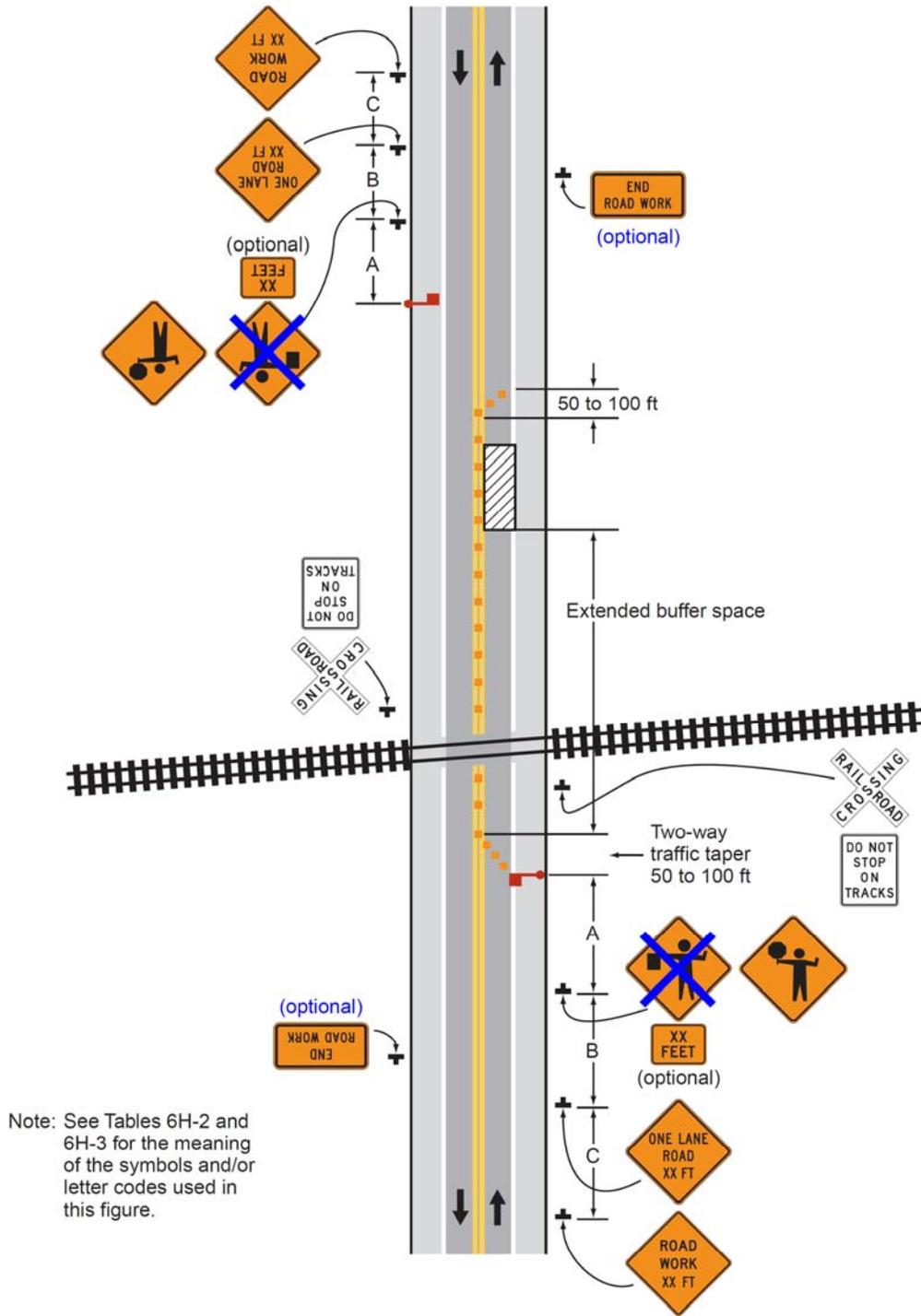
*Guidance:*

8. *When used, the BE PREPARED TO STOP sign should be located ~~before~~ after the Flagger symbol sign.*

**Standard:**

9. **At night, flagger stations shall be illuminated, except in emergencies.**

**Figure 6H-46. Work in the Vicinity of a Grade Crossing (TA-46)**



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

**Typical Application 46**

## Notes for Figure 6H-101CA) – Typical Application 101(CA) Shoulder Closure on Urban (Low Speed) Locations to Accommodate Bicyclists

*Guidance:*

- 1. When existing accommodations for bicycle travel are disrupted or closed, information and devices contained in Figures 6H-101(CA) through 6H-104(CA), as appropriate per situation encountered, should be used to consider the needs and control of bicyclists through a TTC zone.*
- 2. SHOULDER CLOSED signs should be used on limited-access roadways where there is no opportunity for disabled vehicles to pull off the roadway.*
- 3. If drivers cannot see a pull-off area beyond the closed shoulder, information regarding the length of the shoulder closure should be provided in feet or miles, as appropriate.*
- 4. The use of a temporary traffic barrier should be based on engineering judgment.*

**Standard:**

- 5. Where temporary traffic barriers are installed, the ends of the barrier shall be treated in accordance with the provisions of Section 6F.85.**

*Option:*

- 6. The barrier shown in this typical application is an example of one method that may be used to close a shoulder of a long-term project.*
- 7. The warning lights shown on the barrier may be used.*

**Standard:**

- 8. The minimum offset from the upstream end of the barrier to the edge of the traveled way shall be at least 15 feet unless shielded by a crash cushion.**

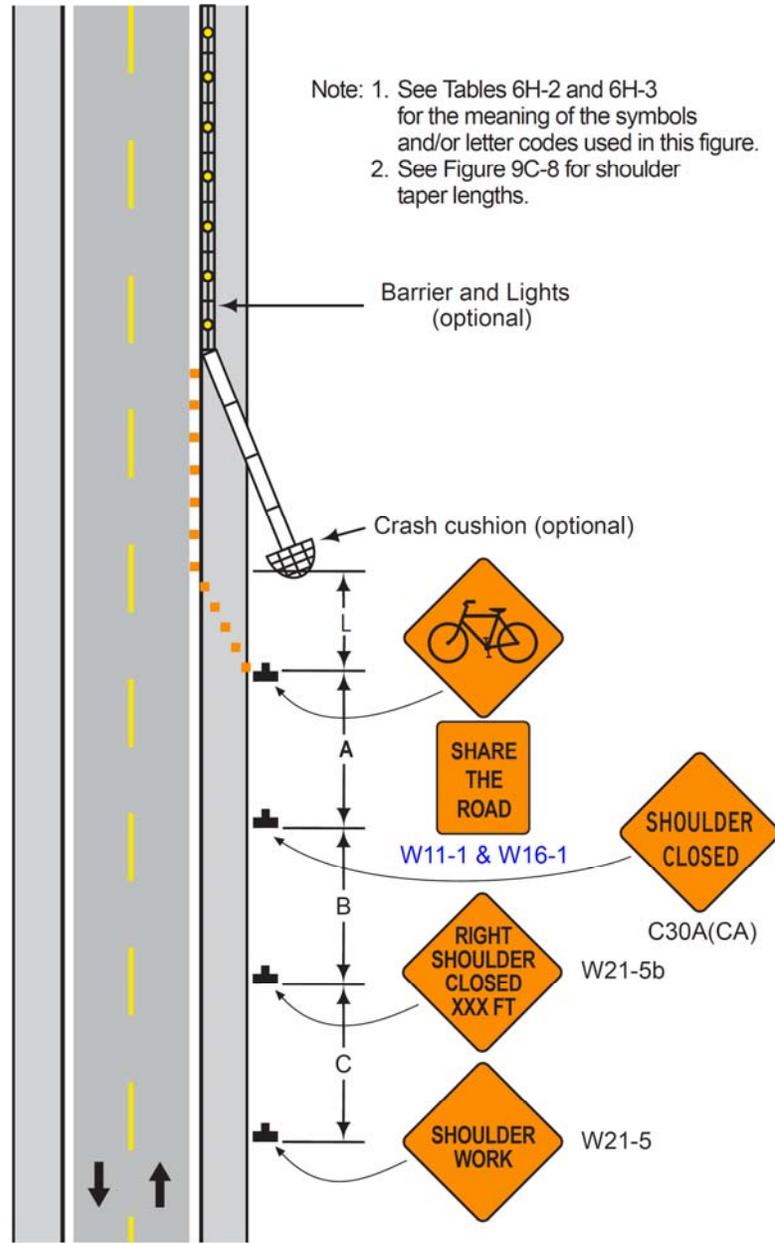
*Guidance:*

- 9. This typical application should only be used in urban areas where posted speed is 25 mph or less. For applications on roadway with a posted speed of 30 mph or more use typical application TA-102(CA).*
- 10. All advance warning signs should be placed so that the path of travel for bicycles is not blocked, while maintaining visibility for road users.*
- 11. Where feasible, an adequate lane width should be provided to allow bicyclists and motor vehicles to travel side by side throughout the TTC zone. If lane width conditions are not met, use the SHARE THE ROAD or Bicycles May Use Full Lane sign.*
- 12. The speeds used for the shoulder taper calculations should be of bicyclists in the project vicinity or if a special event such as a bike race, the expected speed of bicyclists approaching the TTC zone.*

**Standard:**

- 13. Temporary traffic barriers, including their end treatments, shall be crashworthy. In order to mitigate the effect of striking the upstream end of a temporary traffic barrier, the end shall be installed in accordance with AASHTO's "Roadside Design Guide" (see Section 1A.11) by flaring until the end is outside the acceptable clear zone or by providing crashworthy end treatments. See Section 6F.85 for more details.**

**Figure 6H-101 (CA). Shoulder Closure on Urban (Low Speed) locations to accommodate bicyclists (TA-101 (CA))**



Typical Application 101 (CA)

**Notes for Figure 6H-102(CA) – Typical Application 102(CA)  
Lane Closure on Freeway, Expressway, Rural and Urban (High Speed)  
Locations to Accommodate Bicyclists**

*Guidance:*

1. *When existing accommodations for bicycle travel are disrupted or closed, information and devices contained in Figures 6H-101(CA) through 6H-104(CA), as appropriate per situation encountered, should be used to consider the needs and control of bicyclists through a TTC zone.*
2. *SHOULDER CLOSED signs should be used on limited-access highways where there is no opportunity for disabled vehicles to pull off the roadway.*
3. *If drivers cannot see a pull-off area beyond the closed shoulder, information regarding the length of the shoulder closure should be provided in feet or miles, as appropriate.*
4. *The use of a temporary traffic barrier should be based on engineering judgment.*

**Standard:**

5. **Where temporary traffic barriers are installed, the ends of the barrier shall be treated in accordance with the provisions of Section 6F.85.**

**Option:**

6. **The barrier shown in this typical application is an example of one method that may be used to close a shoulder of a long-term project.**
7. **The warning lights shown on the barrier may be used.**

**Standard:**

8. **The minimum offset from the upstream end of the barrier to the edge of the traveled way shall be at least 15 feet unless shielded by a crash cushion.**

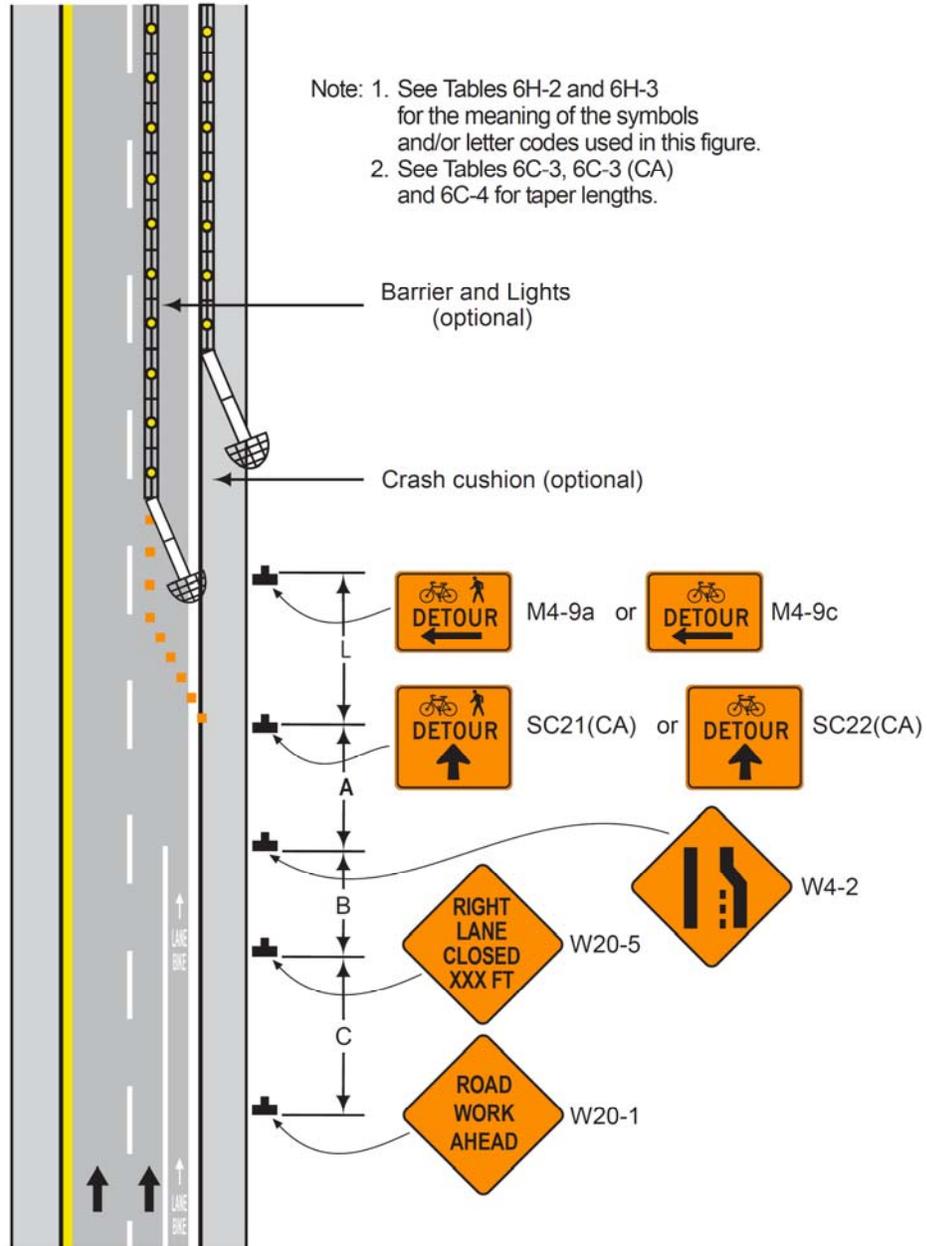
*Guidance:*

9. *All advance warning signs should be placed so that the path of travel for bicycles is not blocked, while maintaining visibility for road users.*
10. *The width of the existing pedestrian facility should be provided for the temporary facility, if practical. When it is not possible to maintain a minimum width of 60 inch throughout the entire length of the pedestrian pathway, a 60 x 60 inch passing space should be provided at least every 200 feet to allow individuals in wheelchairs to pass.*

**Standard:**

11. **Temporary traffic barriers, including their end treatments, shall be crashworthy. In order to mitigate the effect of striking the upstream end of a temporary traffic barrier, the end shall be installed in accordance with AASHTO's "Roadside Design Guide" (see Section 1A.11) by flaring until the end is outside the acceptable clear zone or by providing crashworthy end treatments. See Section 6F.85 for more details.**

**Figure 6H-102 (CA). Lane Closure on Freeway, Expressway, Rural and Urban (High Speed) locations to accommodate bicyclists (TA-102 (CA))**



Typical Application 102 (CA)

## Notes for Figure 6H-103(CA)—Typical Application 103(CA) Detour for Bike Lane on Roads with Closure of One Travel Direction

*Guidance:*

1. *When existing accommodations for bicycle travel are disrupted or closed, information and devices contained in Figures 6H-101(CA) through 6H-104(CA), as appropriate per situation encountered, should be used to consider the needs and control of bicyclists through a TTC zone.*
2. *This plan should be used for streets without posted route numbers.*
3. *On multi-lane streets, Detour signs with an Advance Turn Arrow should be used in advance of a turn.*

*Option:*

4. The STREET CLOSED legend may be used in place of ROAD CLOSED.
5. Additional DO NOT ENTER signs may be used at intersections with intervening streets.
6. Warning lights may be used on Type III Barricades.
7. Detour signs may be located on the far side of intersections.
8. A Street Name sign may be mounted with the Detour sign. The Street Name sign may be either white on green or black on orange.

**Standard:**

9. **When used, the Street Name sign shall be placed above the Detour sign.**

*Guidance:*

10. *The DETOUR (M4-8) sign should be placed on tangent sections at intervals not to exceed 1300 feet and at major intersections.*

*Option:*

11. In urban areas, the M4-8 signs may be placed at every intersection.

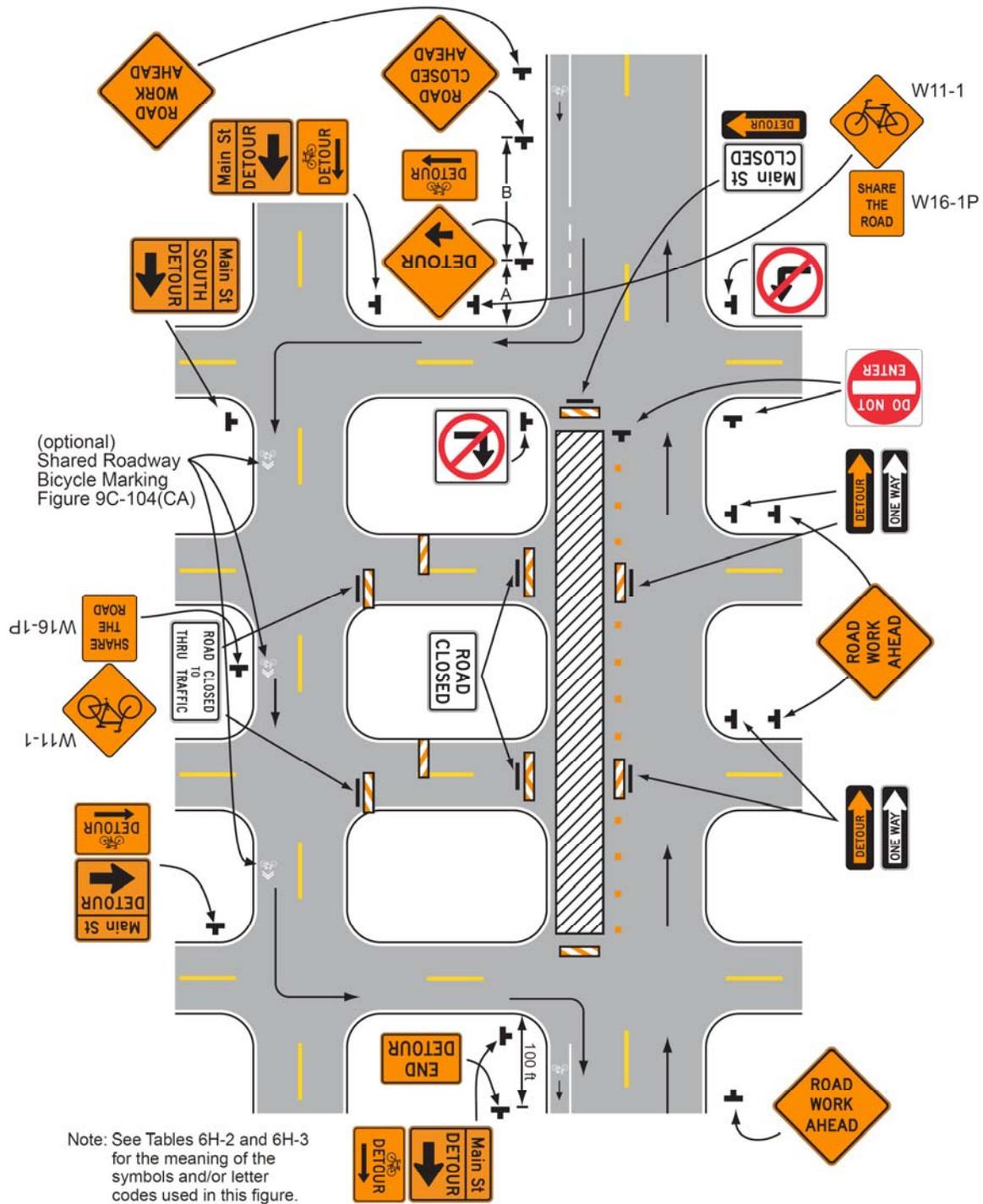
*Guidance:*

12. *When the detour is applicable to bicyclists and not pedestrians, the Bicycle Detour (M4-9c) sign should be used instead of the Pedestrian/Bicycle Detour (M4-9a) sign.*
13. *All advance warning signs should be placed so that the path of travel for bicycles is not blocked, while maintaining visibility for road users.*

*Option:*

14. For long-term duration projects (see Section 6G.02), the shared roadway bicycle marking may be used along detours with on-street parking and inadequate lane width.

**Figure 6H-103 (CA). Detour for Bike Lane on Roads with Closure of One Travel Direction (TA-103 (CA))**



**Typical Application 103 (CA)**

## Notes for Figure 6H-104(CA)—Typical Application 104(CA) Right Lane and Bike Lane Closure on Far Side of Intersection

*Guidance:*

- 1. When existing accommodations for bicycle travel are disrupted or closed, information and devices contained in Figures 6H-101(CA) through 6H-104(CA), as appropriate per situation encountered, should be used to consider the needs and control of bicyclists through a TTC zone.*
- 2. If the work space extends across a crosswalk, the crosswalk should be closed using the information and devices shown in Figure 6H-29.*

*Option:*

- 3. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a right lane having significant right turning movements, then the right lane may be restricted to right turns only, as shown. This procedure increases the through capacity by eliminating right turns from the open through lane.*
- 4. For intersection approaches reduced to a single lane, left-turning movements may be prohibited to maintain capacity for through vehicular traffic.*
- 5. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.*
- 6. Where the turning radius is large, it may be possible to create a right-turn island using channelizing devices or pavement markings.*

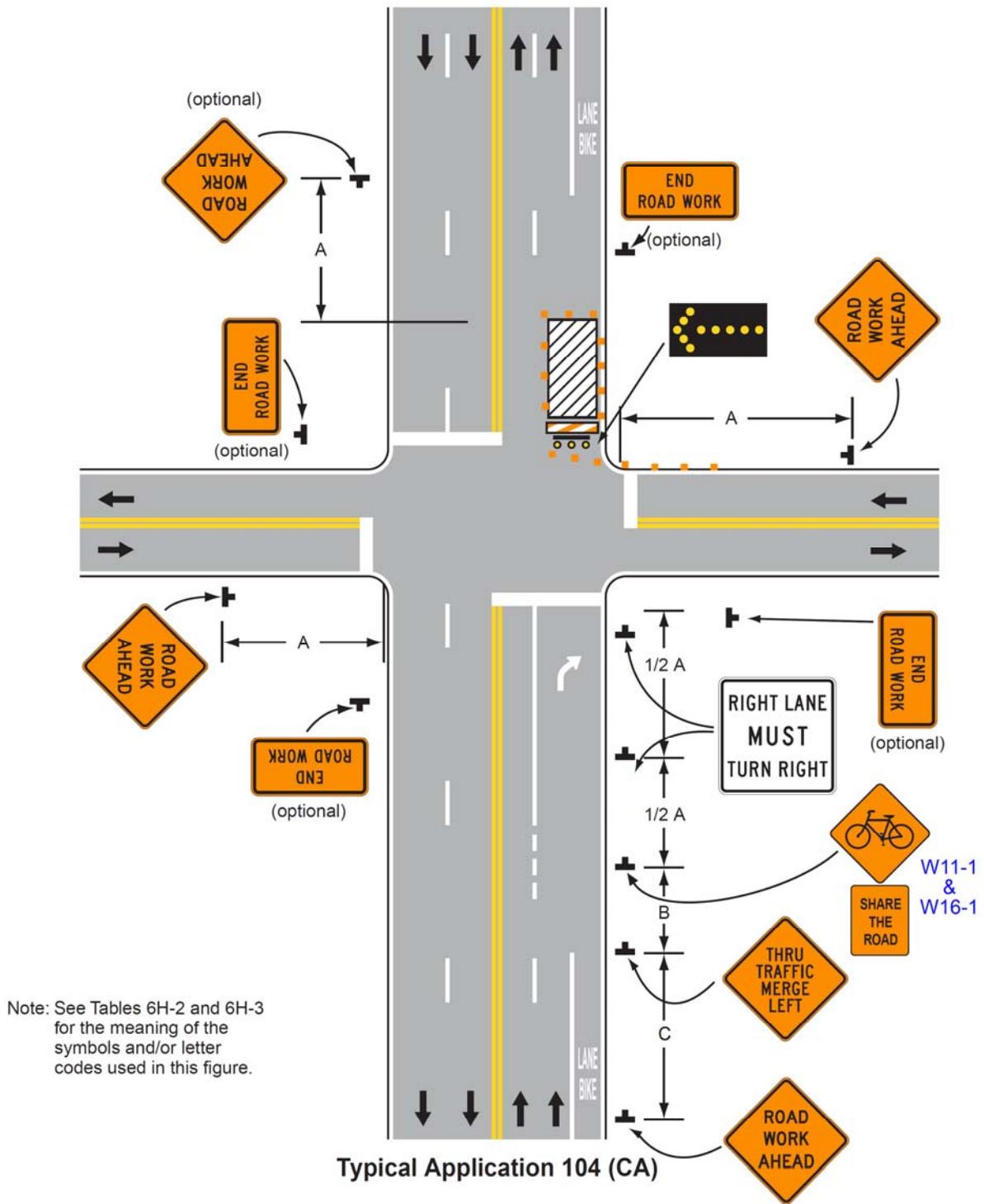
*Guidance:*

- 7. All advance warning signs should be placed so that the path of travel for bicycles is not blocked, while maintaining visibility for road users.*
- 8. For long-term duration projects (see Section 6G.02), consideration should be given to installing signs in an overhead location.*

*Option:*

- 9. A high-level warning device (flag tree) may supplement the advance warning signs. Refer to Section 6F.62.*

**Figure 6H-104 (CA). Right Lane and Bike Lane Closure on Far Side of Intersection (TA-104 (CA))**



## Notes for Figure 6H-105(CA)—Typical Application 105(CA) Work in Side of Road with Low Traffic Volumes

*Guidance:*

1. *The lanes on either side of the center work space should have a minimum width of 10 feet as measured from the near edge of the channelizing devices to the edge of pavement or the outside edge of paved shoulder.*
2. *All advance warning signs should be placed so that the path of travel for bicycles is not blocked while maintaining visibility for road users.*

**Standard:**

3. **Workers in the roadway shall wear high-visibility safety apparel as described in Section 6D.03.**

**Option:**

4. Flashing warning lights and/or flags may be used to call attention to the advance warning signs.
5. If the closure continues overnight, warning lights may be used on the channelizing devices.
6. A lane width of 9 feet may be used for short-term stationary work on low-volume, low-speed roadways when motor vehicle traffic does not include longer and wider heavy commercial vehicles.
7. A work vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights may be used instead of the channelizing devices forming the tapers or the high-level warning devices.
8. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

**Standard:**

9. **Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.**
10. **Note 6 shall not be applicable for State highways. Note #1 shall be used instead for State highways**

**Figure 6H-105 (CA). Work on Side of Road With Low Traffic Volumes (TA-105 (CA))**

